NOTES ON NORTH AMERICAN SPECIES OF NEPTICULA WITH DESCRIPTIONS OF NEW SPECIES (LEPIDOPTERA).

BY ANNETTE F. BRAUN. CINCINNATI, O.

Nepticula cratægifoliella Clemens.

Nepticula cratægifoliella Clemens, Proc. Ent. Soc. Phil., I, 83, 1861; Tin. No. Am., 173, 1872; Dyar, List. N. A. Lep., No. 6194, 1902.

Mines of this species, which Clemens named from mine and larva on *Cratægus parvifolia* Ait., occur at Cincinnati on *Cratægus punctata* Jacq. The mines on this species of *Cratægus* sometimes average about 2 mm. in width during the later portion of the mine, but are more often a little narrower, and the frass line is often rather broad. In other respects they agree well with Clemens' description of the mine. The larva, as Clemens notes, is bright green. The cocoon is reddish brown, broader at the anterior end, not much depressed, The imago may be described as follows:

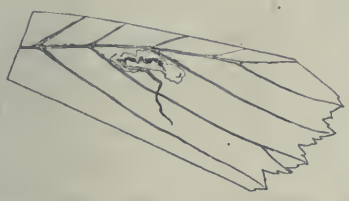

Fig. 1.—Mine of *N. cratægifoliella*

Palpi pale ocherous. Tuft ocherous, faintly tinged with red. Antennæ ocherous, partly suffused with fuscous, eye-caps ocherous.

Thorax and fore wings ocherous, the extreme edge of the costa near the base purplish fuscous, and a broad purplish fuscous band at the apex of the wing. Beyond this band the cilia are pale ocherous, giving the appearance of an ocherous apex preceded by a dark band. Cilia opposite the ends of the band concolorous with it. Hind wings and cilia pale grey.

Legs ocherous. Abdomen purplish fuscous above, ocherous beneath.

Expanse: 3.5 mm.

One specimen bred from a mine collected July 8th; the imago appeared July 29th. The mines occur again more abundantly during the last few days of August and the early part of September.

I refer to this species a flown specimen collected by Mr. Fred Marloff, Oak Station, Pa., June 5th, 1910. In this specimen the

eye-caps are yellowish white and the wings expand 4.5 mm. In all other respects it agrees with the bred specimen.

A distinct and very easily recognized species.

Nepticula latifasciella Chambers.

Nepticula latifasciella Chambers, Bull. Geol. Surv. Terr., IV, 106, 1878; Dyar, List N. A. Lep., No. 6200, 1902.

In the description of this species, Chambers notes that it was taken resting on the trunks of chestnut trees, the leaves of which were full of empty *Nepticula* mines.

I have bred a number of specimens on red and scarlet oaks. The mine is a narrow linear tract gradually broadening to its end, where it measures scarcely 1.5 mm. in width. At first the frass is deposited in a broad line through the centre, later scattered across almost the entire breadth and toward the end of the mine collected in a broad band. On red oak, the mine measures approximately 5 cm. in length; on scarlet oak, it is much shorter, often not exceeding 3 cm. The larva is bright green and escapes from the mine through the lower surface of the leaf. Cocoon rough, ovoid and whitish in color. There are at least two (probably four) generations a year. The mines are abundant toward the end of July and at the beginning of September.

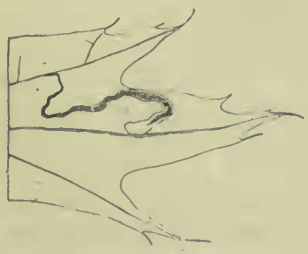

Fig. 2.—Mine of *N. latifasciella*.

Nepticula trinotata n. sp.

Palpi very pale ocherous. Tuft ocherous. Antennæ fuscous, eye-caps whitish. Thorax with deep blue reflections.

Fore wings velvety black, with deep blue reflections in the basal third and somewhat irrorated in the apical third, the scales here having pale bluish iridescent bases. At the basal third on the costa is a white spot of variable size, faintly tinted with violet in some lights. At the apical third there is a costal and an opposite dorsal spot, each larger and of a purer lustrous white colour than the spot at the basal third. The costal spot is usually more oblique,

its tip extending outwardly beyond the opposite dorsal spot. Cilia almost entirely pure white. Hind wings and cilia pale silvery gray.

Legs pale grayish ocherous, tarsal joints dark tipped. Abdomen purplish fuscous above, paler and iridescent beneath in the female.

Expanse: 4.5-5 mm.

Ten specimens bred at Cincinnati, O., from blotch mines on *Hicoria minima* (Marsh.) Britton. The mine is at first an extremely narrow linear tract, later suddenly expanding into a broader tract, 1 mm. or more in width, which in turn becomes a blotch, varying in width from 3 to 6 mm. The mine is almost transparent even in the early linear portion, which thus distinguishes it from that of *N. juglandifoliella* Clemens, on hickory. This is the large blotch mine to which Chambers refers (Psyche, III, 66, 1880). The larva is of a dull grayish colour Cocoon reddish brown.

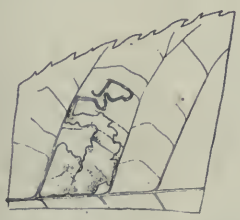

Fig. 3.—Mine of *N. trinotata*.

There are two generations a year, the mines of the first appearing during the early part of July and producing imagoes during the first week of August. The mines of the second generation may be collected at the beginning of September. Up to this time I have found the mines only on the single species of hickory noted above, and never on *Carya alba*, as Chambers says.

Types in my collection.

Nepticula flavipedella n. sp.

Palpi whitish. Tuft usually dark brown, collar creamy white; in one specimen the tuft is reddish ocherous on the face, brown on the vertex. Antennæ fuscous, eye-caps creamy white. Thorax dark purplish brown.

Fore wings dark purplish brown, somewhat shining, cilia with silvery tips. Hind wings and cilia gray.

Fore legs, except the femora, dark brown; middle legs pale silvery, tarsi yellow; hind legs silvery, tibiæ dark brown, tarsi

yellow. Abdomen dark purplish above, paler beneath in the female.

Expanse: 3.5-4 mm.

Three specimens, Cincinnati, O., two bred from mines on swamp white oak (*Quercus platanoides* (Lam.) Sudw.) the other on pin oak (*Q. palustris* Du Roi.) The mine is a very characteristic linear tract. The egg is placed on the upper side of the leaf and the larva for the first few millimeters mines near the upper surface, making a very narrow indistinct mine. Then the mine abruptly enlarges slightly and for a length of 8 or 9 mm. the leaf substance is entirely consumed and the mine rendered transparent. Then follows another enlargement, and the mine, often much contorted, increases very gradually in breadth to the end, where it measures 2 mm. across. This latter portion of the mine is not transparent. The frass is sprinkled in separate grains across the entire breadth of the mine. The accompanying figure shows the appearance of the mine when held toward the light. While most commonly found on pin and swamp white oak, the mine occasionally occurs on red and scarlet oaks. There are three generations a year: mines can be collected during early June, the latter half of July, and the early part of September. The larva is usually green, occasionally purplish and escapes from the mine through the lower surface of the leaf. The cocoon is almost white, woven of coarse rough silk.

Fig. 4.—Mine of *N. flavipedella.*

The moths are almost indistinguishable from specimens of *N. castaneæfoliella* Chambers; the only constant difference I have found to separate them is the yellow colour of the middle and hind tarsi of *N. flavipedella* in contrast with the sordid white tarsi of *N. castaneæfoliella.*

Types in my collection.

Nepticula chalybeia n. sp.

Palpi grayish ocherous. Tuft ocherous, collar yellowish white. Antennæ fuscous, eye-caps yellowish white. Thorax steel-gray.

Fore wings very narrow, steel-gray, with faint greenish golden reflections, the apex very slightly tinged with purple. Cilia gray, purple tinged around the apex. Hind wings gray.

Legs gray, tarsi ocherous. Abdomen dark gray, with a purplish luster.

Expanse: 3.5 mm.

Two specimens bred from mines on wild pear, *Pyrus communis* L., at Cincinnati, O. The mine is a short linear tract, brownish green in colour, not exceeding 2 cm. in length and gradually increasing in breadth to the end, where it measures 1.5 to 2 mm. across. The cocoon is small, obovoid and greenish brown. There are three generations a year, and mines may be collected in the early part of June, in July and during the last part of August.

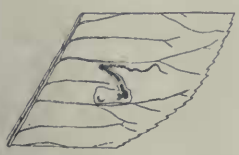

Fig. 5.—Mine of *N. chalybeia*.

Its general pale colour, narrow wings and mall size easily distinguish this species from *N. pomivorella* Pack. which mines leaves of apple.

Types in my collection.

Nepticula apicialbella Chambers

Nepticula apicialbella Chambers, Can. Ent., V. 127, 1873; Cin. Quart. Jn. Sci., II, 118, 1875; Dyar, List N. A. Lep., No. 6185. 1902.

Syn. *leucostigma* Braun, Jn. Cin. Soc. Nat. Hist., XXI, 88, 1912.

A larger series, among them a flown specimen in which the white scales at the extreme apex are lacking, and merely the apical cilia are white, establishes the synonymy above given *Apicialbella* was described from flown specimens. This is the only species I have seen with the oblique fascia.

Nepticula altella n. sp.

Palpi silvery gray. Tuft rust red, a little yellowish behind. Antennæ fuscous, eye-caps yellowish white. Thorax dark purplish brown.

Fore wings before the fascia purple brown, beyond it deep golden brown with purple reflections; the general colour to the naked eye is deep purple before the fascia and brown beyond it. A silvery fascia crosses the wing at three-fifths, and is usually a little broader on the margins of the wings. Cilia gray. Hind wings deep purple, becoming brown toward the tip.

Legs fuscous, tarsi of the middle and hind pair silvery. Abdomen purplish brown.

Expanse: 6.5-7 mm.

Described from three specimens bred on pin oak, *Quercus palustris* Du Roi and nine captured specimens, all from Cincinnati.

The mine is placed on the lower side of the leaf and is very much contorted, winding back and forth, the bends almost contiguous, and the frass is deposited across the entire breadth of the mine. In its early portion, the mine is scarcely visible on the upper side of the leaf, except as a slight discoloration, later it becomes more distinct, because of the partially eaten parenchyma. The mine is extremely long, but measures only 1 to 1.5 mm. in width at its end. The accompanying illustration shows the mine as it appears when held toward the light; its distinctness has been somewhat exaggerated in the drawing in order to show its course. Cocoon dark brown, somewhat flattened, with projecting edges.

Fig 6.—Mine of *N. altella*.

The mines were collected October 13th and produced imagoes the following May; the flown specimens were also taken in May. The species appears to be single brooded.

Types in my collection.

Nepticula opulifoliella n. sp.

Palpi grayish ocherous. Tuft reddish ocherous, collar sometimes pale yellowish. Antennæ fuscous, eye-caps pale shining yellowish. Thorax dark fuscous, with purple and blue reflections.

Fore wings dark fuscous with pronounced purple and blue reflections, shading to bronzy green below the fold. At three-fifths is a broad very shining silvery fascia with faint golden lustre. Cilia gray, extreme tips pearly white. Hind wings and cilia gray.

Legs dark fuscous, except the middle pair, which are silvery. Abdomen purplish fuscous above, paler beneath in the female.

Expanse: 3.5 mm.

Eleven specimens bred from mines on Opulaster (*Opulaster opulifolius* (L.) Kuntze) at Cincinnati. The mine is a narrow linear brown tract with a dark line of frass running through it. The cocoon is reddish brown, its anterior end broader and flattened. On July 13th the larvæ were nearly full-fed, and all pupated within a few days. The imagoes appeared July 29th to August 4th.

Fig. 7.—Mine of *N. opulifoliella*.

This species resembles *N. rosæfoliella* Clemens, but differs from it in the smaller size, the narrower more lustrous fore wings and the much broader fascia.

Types in my collection.

Nepticula terminella n. sp.

Palpi dull, pale ocherous gray. Tuft on the face dull brownish, on the vertex and head black. Antennæ gray, eye-caps shining white, with a very faint yellow tinge. Thorax bronzy.

Costal half of the fore wing to the fascia, blue-purple, the blue predominating at the extreme edge; below the costa the wing shades into a deep brilliant golden color, becoming more bronzy as it nears the fascia. The fascia is situated just beyond the middle of the wing, is almost straight and has a brilliant silvery lustre. Apical third of the wing blue purple, blue predominating. Just below the apex a double row of silvery scales margins the termen, becoming a single row toward the dorsum and sometimes connected with the fascia. Cilia gray. Hind wings and cilia gray, with a purple tinge.

Legs dark gray, tibiæ and tarsi of the fore pair and tarsi of the others, ocherous. Abdomen dark purplish gray above, yellowish beneath toward the tip, anal tuft yellow.

Expanse: 5-5.5 mm.

Twenty-two specimens bred from mines on red oak (*Quercus rubra* L.) Cincinnati, O.; one captured specimen, taken at Oak Station, Pa., May 17th, 1910, by Mr. Fred Marloff.

The mine is a pale greenish gradually broadening linear tract, 3.5 mm. wide at the end, with a blackish line of frass through the centre. Larva yellow even when very young; thus this mine can early be distinguished from the other linear mines on oak. Cocoon brownish ocherous, obovoid.

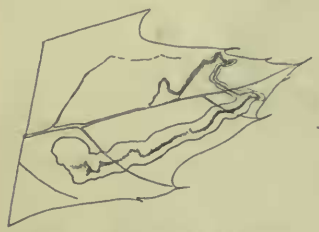

Fig. 8.—Mine of *N. terminella*.

There are three generations a year, and, in favourable seasons, a fourth. Mines containing full-grown larvæ may be collected in the middle of June, the latter part of July, the end of August and beginning of September, and during the latter part of October up to as late as the ninth of November, producing imagoes during the summer within two weeks after pupation. The mines occur most commonly on red oak, but also on pinoak (*Q. palustris* Du Roi) on black oak (*Q. velutina* Lam.) and on *Q. marylandica* Muench.

A cotype in Mr. Marloff's collection.

NEW AMERICAN CHRYSOPIDÆ.

BY NATHAN BANKS, EAST FALLS CHURCH, VA.

The following five new species of Chrysopidæ are among recent additions to my collection from Central and South America Of particular interest is the *Nothochrysa*, which is quite different from the other species of the genus from South America and more allied to our Californian one.

Chrysopa rufolinea, n. sp.

Yellowish green, a sinuate band of reddish below antennæ, and one across base of the clypeus, a red spot on the cheek, a red line